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To: Dr. R. A. Fenner

Date: September 28, 1992

From: P. F. Grantham and W. L. Mokarry

Subject: Equilibration of Filler vs Cigarettes

PURPOSE: A study was run to determine if differences in OV between equilibrated filler and equilibrated cigarettes made from the same filler could be explained by differences in humectant loss.

RESULTS: Analysis of results obtained from cased DBC Bright and uncased E55 Bright show no difference between filler and cigarette data for GC water. The cased DBC Bright filler did exhibit a steady decline in propylene glycol over 48 hours of equilibration, while the cased DBC Bright cigarettes decreased only slightly (79% loss vs 15%). The OV difference between the cased DBC Bright filler and cigarettes appeared to stabilize after 24 hours (~1.9 OV units). No significant difference in OV was observed between uncased E55 Bright filler and cigarettes. The differences in glycerin between filler and cigarettes were insignificant for both cased and uncased samples.

CONCLUSIONS: The difference in equilibrated OV observed between cased DBC Bright filler and cigarettes can be explained by a greater loss of propylene glycol from the filler during the equilibration process.

PROCEDURE: Samples of cased DBC Bright filler and cigarettes, and uncased E55 Bright filler and cigarettes were obtained from the semiworks. Filler samples were equilibrated in the filler cabinet in Materials Evaluation Laboratory, while cigarette samples were equilibrated in cigarette plenum in the Physical Testing Laboratory. All samples were analyzed for OV, GC water, propylene glycol, and glycerine (2 replicates for each analysis). Samples were pulled for analyses before equilibration (time zero), at thirty minutes, one hour, ninety minutes, two hours, three hours, four hours, six hours, twenty-four hours, and forty-eight hours. Standard equilibration conditions of 75°F and 60% RH were used.

DISCUSSION: The data shown in Tables 1 - 4 and Figures 1 - 4 represent the average values of the two replicate determinations for each analysis.

Figure 1 shows the plot of OV vs equilibration time. Very small differences are observed for the uncased samples. The cased cigarettes show a significantly higher OV than the cased filler after 24 hours.

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Water (determined by GC) is shown plotted against equilibration time in Figure 2. After 24 hours, no significant differences are seen between cigarettes and filler for either cased or uncased samples.

Propylene glycol content is plotted in Figure 3. A steady decline in PG is shown for the cased filler as compared to the cased cigarettes. There are two factors that would explain why the filler loses PG so quickly as compared to the cigarettes. First, the paper barrier of the cigarettes would help retain humectants. Second, during filler equilibration, conditioned air is forced through the bed of filler. For cigarette equilibration, conditioned air is passed above and below the tray containing the samples. The forced air in direct contact with the filler sample is more likely to remove the highly volatile propylene glycol.

Figure 4 shows the plot of glycerin vs equilibration time. Glycerin is much less volatile than propylene glycol. No significant losses of glycerin are observed over 48 hours for filler or cigarettes.

These results show that 1) uncased samples show no significant difference in OV between filler and cigarettes; 2) both cased and uncased samples show no significant difference in GC water between filler and cigarettes; and 3) cased samples show a steady decrease in PG over a 48 hour equilibration period for filler as compared to cigarettes. The observed OV difference between equilibrated cased cigarettes and equilibrated cased filler can best be explained by the accelerated PG loss of the filler.

Attachments

cc: Central Files

H. Burnley	D. Leyden
T. Callaham	C. Lilly
G. Carter	K. Mitchell
S. Clark	R. Mullins
R. Cox	W. Nichols
C. Ellis	D. Rockwell
J. Garman	J. Sampson
T. Holland	D. Snead
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D. Knudson	B. Strang
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